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PATENT Attorney Docket No. 131\*198



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## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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(Printed name of person mailing paper)  In re Application of:  Xiang-Gen XIA  Serial No.: 09/658,184  Filed: September 8, 2000  For: PRECODED OFDM SYSTEMS ROBUST TO SPECTRAL NULL CHANNELS AND VECTOR OFDM SYSTEMS WITH REDUCED CYCLIC PREFIX LENGTH  REDUCED CYCLIC PREFIX LENGTH  (Signature of person mailing paper)  Filed: September of person mailing paper)  For prechology Center 2600  For prechology Center 2600  Examiner: Robert W. Wilson	James M. Olsen	_\_\_	arms 1. / Van
Xiang-Gen XIA  Serial No.: 09/658,184  Filed: September 8, 2000  For: PRECODED OFDM SYSTEMS ROBUST ) TO SPECTRAL NULL CHANNELS AND ) VECTOR OFDM SYSTEMS WITH  Technology Center 2600  Examiner: Robert W. Wilson  Description:  To SPECTRAL NULL CHANNELS AND ) VECTOR OFDM SYSTEMS WITH  Technology Center 2600  Examiner: Robert W. Wilson	(Printed name of person mailing paper)	(Signat	ature of person mailing paper) RECEIVED
Xiang-Gen XIA  Serial No.: 09/658,184  Filed: September 8, 2000  For: PRECODED OFDM SYSTEMS ROBUST ) TO SPECTRAL NULL CHANNELS AND ) VECTOR OFDM SYSTEMS WITH  Technology Center 2600  Carrow Art Unit: 2661  Examiner: Robert W. Wilson  VECTOR OFDM SYSTEMS WITH  To Specific 2600  Carrow Art Unit: 2661  Carrow Art Unit: 266	In re Application of:	)(	JUL 2 6 2004
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TO SPECTRAL NULL CHANNELS AND ) VECTOR OFDM SYSTEMS WITH )	Filed: September 8, 2000	)	Examiner: Robert W. Wilson
VECTOR OFDM SYSTEMS WITH )	For: PRECODED OFDM SY	'STEMS ROBUST )	
,	TO SPECTRAL NULL	CHANNELS AND )	
REDUCED CYCLIC PREFIX LENGTH )	VECTOR OFDM SYST	EMS WITH )	
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Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450

Sir:

## **AMENDMENT**

In response to the Office Action dated April 19, 2004, please amend the application as follows:

Amendments to the Specification begin on page 2 of this paper.

Amendments to the Claims are reflected in the listing of claims which begins on page 3 of this paper.

Remarks begin on page 6 of this paper.

## Amendments to the Specification

Please replace the paragraph on page 18, lines 11-18 with the following amended paragraph:

The vector OFDM systems comprise the precoded systems shown in Fig. 2 with a special precoder  $G(z) = I_{KxK}$  that blocks the input data into  $K \times 1$  vectors so that the data rate is not changed, i.e., no redundancy is added. In other words, the precoder of Equation (4.4) in the precoded OFDM systems takes the squared identity matrix, i.e., M = K in Equation (4.4). Similar to Equation (4.21), the vector cyclic prefix data rate overhead is:

$$\frac{K(N\widetilde{\Gamma})}{KN} \approx \frac{N + \frac{L}{K}}{N} \cdot \frac{K(N + \widetilde{\Gamma})}{KN} \approx \frac{N + \frac{L}{K}}{N}. \quad (5.1)$$

Compared to the data rate overhead (N + L)/N for the conventional OFDM systems, the data rate overhead in the vector OFDM systems is reduced by K times, where K is the vector size.